REMARKS

Claim Amendments

Claims 5-44 have been canceled.

Claim 1 has been amended to recite that the compound is soluble and that when the one or more non-amphipathic groups of the derivatized compound comprising hematin are polyalkylene glycol groups, the polyalkylene glycol groups have a molecular weight of about 5,000 to about 15,000. Support for the amendments can be found at page 4, lines 4-6 and page 6, lines 5-11 of the specification.

Claim 45 has been added. Support for new Claim 45 can be found at page 5, lines 24 to page 6, line 4 of the specification.

Supplemental Information Disclosure Statement

A Supplemental Information Disclosure Statement (SIDS) is being filed concurrently herewith. Entry of the SIDS is respectfully requested.

Applicants' Invention

Applicants' invention is directed to a compound comprising hematin derivatized with one or more non-proteinaceous amphipathic groups, where the compound is water-soluble. Claim 1 recites that if the one or more non-proteinaceous amphipathic groups on the hematin are polyalkylene glycol groups, the polyalkylene glycol groups have a molecular weight of about 5,000 to about 15,000.

Advantages of Applicants' Invention

The derivatized hematins of the present invention are water soluble and recyclable, which virtually eliminates the need for toxic reagents and solvents, and thus creates an environmentally friendly synthesis for polyaromatic polymers. The water solubility of the derivatized hematin resolves one of the primary limitations of catalysts currently used in the commercial synthesis of polyaromatic polymers, namely by providing a catalyst that is active and stable over a wide range of pHs. In contrast, conventional underivatized hematin is poorly soluble in acidic solutions, such that underivatized hematin has a low catalytic rate in acidic solutions. Moreover, the

derivatized hematins of the present invention, in a combination with a template, reduce the amount of branching during polymerization of polyaromatic polymers, leading to a structurally more consistent product.

Rejection of Claims 1-5 Under 35 U.S.C. § 102(b) or § 103(a)

Claims 1-5 are rejected under 35 U.S.C. § 102(b) or § 103(a) as being anticipated by or as being obvious over Chemical Abstract 128:162418. Chemical Abstract 128:162418 is an abstract of U.S. Patent No. 5,711,867, hereinafter referred to as "the '867 Patent." The full text of the '867 Patent is being submitted concurrently herewith in the IDS.

The Examiner stated that the reference discloses a hematin compound derivatized with one or more non-proteinaceous amphipathic groups, specifically polyalkylene glycol. The '867 Patent does not teach polyalkylene glycol groups having a molecular weight of about 5,000 to about 15,000. Claim 1 has been amended to recite that when the one or more non-amphipathic groups of the derivatized compound comprising hematin are polyalkylene glycol groups, the polyalkylene glycol groups have a molecular weight of about 5,000 to about 15,000. Thus, Claim 1, as amended, and Claims 2-4 and 45 dependent therefrom, are not anticipated by the '867 Patent. Claim 5 has been canceled.

Claims 1-4 and 45 are not obvious over the '867 Patent. The derivatized hematin compound of the '867 Patent is simply an intermediate in producing a metalloporphyrin that is attached to an electrode by a "spacer arm" (see Col. 9, lines 29 through the bottom of Col. 12). In particular, the scheme in Columns 11 and 12 show that heme is reacted with a polyethylene glycol to form an intermediate compound that is subsequently attached to an electrode. No utility for the compound is disclosed other than as an intermediate compound in the synthesis of electrode-bound metalloporphyrins. In particular, the '867 Patent does not teach that derivatizing hematin with an amphiphilic group increases the solubility of hematin in acidic, aqueous solutions.

MPEP § 2144.09 states that if prior art compounds are disclosed as having utility only as intermediates, claimed structurally similar compounds may not be *prima facie* obvious over the prior art:

> Similarly, if the prior art merely discloses compounds as intermediates in the production of a final product, one of ordinary skill in the art would not have been motivated to stop the reference synthesis and investigate the intermediate compounds with an expectation of arriving at claimed compounds which have different uses. *In re Lalu*, 747 F.2d 703, 223 USPQ 1257 (Fed. Cir. 1984).

Based upon MPEP § 2144.09, Applicants submit that the instantly claimed compounds are not obvious in view of the '867 Patent. The '867 Patent does not teach a water soluble hematin compound derivatized with any amphipathic groups other than polyalkylene glycols. In the case of polyalkylene glycols, the '867 Patent does not teach or otherwise suggest derivatizing hematin with a polyalkylene glycol group having a molecular weight of about 5,000 to about 15,000. Clearly, one of ordinary skill in the art would not have been motivated to prepare the instantly claimed compounds based upon the teachings of the '867 Patent.

New Claim 45, which is dependent from Claim 1, is directed to a compound comprising hematin that is derivatized with one or more particular non-proteinaceous amphipathic groups. None of these particular non-proteinaceous amphipathic groups are disclosed by the '867 Patent.

Applicants have now demonstrated that Claim 1, as amended, and Claims 2-4 and 45 dependent therefrom are neither anticipated by or obvious over the '867 Patent. Claim 5 has been canceled. The derivatized hematin compound of the '867 Patent is merely an intermediate in preparing an insoluble electrode to which a metalloporphyrin such as hematin is attached. Reconsideration and withdrawal of the rejection are respectfully requested.

SUMMARY AND CONCLUSIONS

Claims 6-44 have been canceled pursuant to the Restriction Requirement. Claim 5 has also been canceled. Claim 1 has been amended to recite that the compound is water soluble and to recite that when the amphipathic groups are polyalkylene glycols, then the molecular weight of the amphipathic group is from about 5,000 to about 15,000. There is no disclosure or suggestion of Applicants' invention, as claimed, in U.S. Patent No. 5,711,867. Therefore, Applicants' invention meets the requirements of 35 U.S.C. §§ 102 and 103.

In view of the above amendments and remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If

the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.

By _____
Jesse A. Pecker
Registration No. 52,883
Telephone: (978) 341-0036
Facsimile: (978) 341-0136

Concord, MA 01742-9133
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